BROOKHAVEN NATIONAL LABORATORY

One of ten national laboratories overseen and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), Brookhaven National Laboratory conducts research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. Brookhaven Lab also builds and operates major scientific facilities available to university, industry and government researchers. Brookhaven is operated and managed for DOE's Office of Science by Brookhaven Science Associates, a limited-liability company founded by the Research Foundation of the State University of New York on behalf of Stony Brook University, the largest academic user of Laboratory facilities, and Battelle, a nonprofit, applied science and technology organization. Visit Brookhaven Lab's electronic newsroom for links, news archives, graphics, and more: **http://www.bnl.gov/newsroom**

NEXT GENERATION SAFEGUARDS INITIATIVE

In 2007, the U.S. Department of Energy's National Nuclear Security Administration (NNSA) launched the Next Generation Safeguards Initiative (NGSI), a robust, multi-year program to develop the policies, concepts, technologies, expertise, and international safeguards infrastructure necessary to strengthen and sustain the international safeguards system as it evolves to meet new challenges. The Human Capital Development subprogram of NGSI supports the recruitment, education, training, and retention of a new generation of international safeguards professionals.

Nuclear Nonproliferation, Safeguards, and Security (NNSS) in the 21st Century

Brookhaven National Laboratory
June 10- June 28, 2013

ELIGIBILITY REQUIREMENTS

Applicants must:

- be 18 years or older
- have valid medical insurance for the duration of the course
- be in or entering graduate school or have recently completed graduate school

APPLICATION REQUIREMENTS

- Completed application form
  found at www.bnl.gov/education/nnss
- Official transcripts of your undergraduate and graduate records
- Two letters of recommendation

The completed application form can be sent by regular mail or as an e-mail attachment to:

NNSS Course
Brookhaven National Laboratory
Building 197C
P.O. Box 5000
Upton, New York 11973
nnss@bnl.gov

Official transcripts and original letters of recommendation should be mailed to the same address

APPLICATION DEADLINES

Applications, transcripts, and letters of recommendation must be received by March 1, 2013.
Applicants will be notified of the outcome of the selection process by March 22, 2013.

Successful applicants will receive

- Housing at or near Brookhaven National Laboratory during the period of the course
- A stipend of $1,000 is available based on a demonstration of need

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

BROOKHAVEN NATIONAL LABORATORY

managed for the U.S. Department of Energy
by Brookhaven Science Associates, a company
founded by Stony Brook University and Battelle

1/13

Cover photo–Kirstie Hansen/IAEA

BROOKHAVEN NATIONAL LABORATORY

Nuclear Nonproliferation, Safeguards, and Security in the 21st Century

An NGSI Course for Prospective, Current, and Recent Graduate Students
www.bnl.gov/education/nnss

2013

Nonproliferation and National Security Department

Nuclear Nonproliferation, Safeguards, and Security in the 21st Century

A Course for Prospective, Current, and Recent Graduate Students in the Physical Sciences, Engineering, and International Relations

The course begins with a primer on nuclear weapons and the nuclear fuel cycle, highlighting the inextricable potential link between the peaceful uses of nuclear energy and the risk of proliferation. Historical material starts with the Acheson-Lilienthal Report and continues through Atoms for Peace and negotiation of the Nuclear Non-Proliferation Treaty (NPT). Then a series of lectures explores the history of peaceful uses of nuclear energy, export controls, the IAEA, and arms control and disarmament. Moving from conceptual themes to actual cases, lecturers conclude the first week with a close examination of past and present nonproliferation successes and failures.

Pride of place in the course is given to safeguards, and the entire second week is devoted to that area. Lectures address such topics as the structure of NPT comprehensive safeguards agreements, material balance accounting, diversion scenarios, design information verification and design of safeguards approaches, and inspection tools and measurements. Because of their nonproliferation significance, verifications at enrichment and reprocessing plants are covered in separate lectures. Because of its importance and currency, special attention is paid to the transition to a strengthened safeguards system (including the Model Additional Protocol), which is based on information collection and analysis and applied at the State level.

A highlight of the second week is a day devoted to an exercise and a demonstration. The exercise is a design information verification at the shut-down Brookhaven Medical Research Reactor. The demonstration is of physical inventory verification practices for nuclear material, with measurements of real material and a search for "anomalies" involving surrogate material.

The third week focuses on nuclear terrorism and homeland security. In conjunction with homeland security, Brookhaven staff demonstrate how radiation monitors work in detecting radiation sources on vehicles and how specific radioactive isotopes can be identified. This week also includes an exercise in which groups of students prepare memoranda to the Secretary of State on important issues about Iran and IAEA safeguards. The course also includes lectures by country experts on India, Iran, and Pakistan.

Dean Calma/IAEA

Dean Calma/IAEA

Vadim Mouchkin/IAEA

For more information consult the following web site:
www.bnl.gov/education/nnss

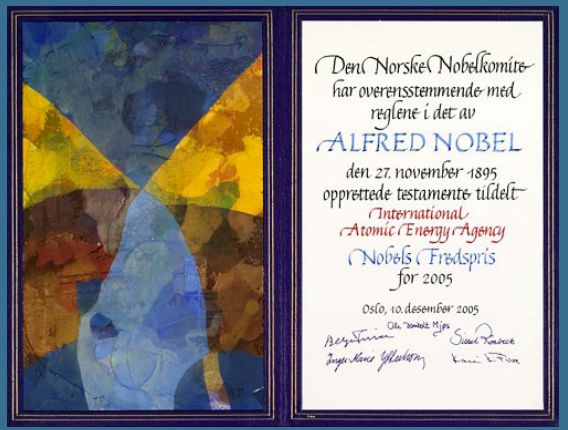
Questions can be sent to **nnss@bnl.gov**

This course is designed to give students a sound understanding of the foundations of the nuclear nonproliferation regime, the IAEA safeguards system and U.S. efforts to meet emerging nuclear proliferation threats. The course will present students with critical assessments of current nonproliferation arrangements. With exercises and demonstrations, the course will introduce students to the techniques and technologies of international safeguards and detection of nuclear and other radioactive materials. Above all, the course aims to give participants the knowledge, analytic tools, and motivation to contribute to improvement of the nonproliferation regime.

NNSS 2013 Course Topical Areas

- Nuclear Fuel Cycle
- Nuclear Weapons
- Strategic Arms Control
- Nuclear Nonproliferation Treaty
- International Atomic Energy Agency (IAEA)
- Nuclear Nonproliferation Successes and Failures
- IAEA Safeguards: Concepts and Implementation Examples
- IAEA Safeguards Design Information Verification Exercise
- IAEA Safeguards Inventory Demonstration
- South Asia and Iran
- Authorities of the IAEA
- Strengthened IAEA Safeguards: Concepts and Implementation Examples
- Nuclear Terrorism
- Demonstration and Exercise on Detecting Radioactive Materials
- Global Nuclear Detection Architecture

In 2005 the Nobel Peace Prize was jointly awarded to the IAEA and Dr. Mohamed ElBaradei, the Director General of the IAEA from 1997 through 2009.



Artist: Trond Botnen
Calligrapher: Inger Magnus